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CANCER RESEARCH AND TREATMENT IN THE USSR

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The first paper gives information on oncological stations established and controlled by the Ministry of Health USSR and some of the results of their work. The second deals with the prophylaxis and treatment of cancer in the cervix of the uterus with special reference to the work of the Roentgeno-Radiological and Oncological Institute of the Ukraine.]

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ORGANIZATION OF THE STRUGGLE AGAINST CANCER IN THE USSR

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The latest data supplied by the anticancer organizations show that success is achieved only if the organizations meet two basic requirements:

(1) They must be mass organizations, embracing the broadest strata of the population;

(2) In their activity, the organizations must rely on the entire system of medical and prophylactic establishments in the country.

In the Soviet Union, the organization of the anticancer campaign is based on these principles of oncology. Being an integral part of a system of homogeneous health organization, the oncological units are State units whose objective is to bring all means of specialized oncological aid, medical and prophylactic, to the entire population -- and all this free of charge. Proceeding from these principles and being based, above all, on the widely ramified network of specialized oncological establishments, the units enlist in their work the large body of medical personnel and the medical facilities which the whole of the nation's therapeutic and prophylactic establishments can offer.

The structure and territorial distribution of the specialized oncological establishments is governed by the aim of placing oncological aid, insofar as possible, at the immediate disposal of the patients. This objective is achieved by a distribution of oncological establishments strictly conforming to the administrative divisions of the country.

The main element of the specialized oncological organization system is the oncological dispensary, an establishment which has the dual function of clinic and polyclinic. Being provided with ample equipment for the detection and treatment of malignant tumors and being directed by a trained oncologist, this dispensary is the local center of the anticancer system in the major regional localities, in the major regional localities within the boundaries of the Soviet Republics, and in many other large cities and industrial centers.

In addition to functions of medical character (diagnosis and treatment of tumors, study of the effectiveness of treatment), other tasks assigned to the oncological dispensary are:

(a) To collect statistics on cases of malignant tumors, and to study the cancer mortality;

(b) To organize and apply mass prophylactic measures aimed at the detection and treatment of precancerous lesions;

(c) To supervise the expansion of the oncological specialty among physicians in the regular medical system;

(d) To educate the public in matters concerning cancer and in methods of protection against it.

To meet these problems, the dispensaries comprise:

(a) A polyclinic, consisting of departments of surgery, obstetrics, otorhinolaryngology, radio-diagnostics, radiotherapy, and roentgenotherapy;

(b) A hospitalization center for diagnosis and treatment, capable of applying all therapeutic procedures;

(c) A department of statistics and a department for organizing the work of all the oncological centers in the given region;

(d) A ward to accommodate patients coming from distant places for consultation or care given at the dispensary.

Outside of their own hospitalization centers, the oncological dispensaries provide for hospitalizing their patients in special oncological sections at general hospitals.

The second line in the system is made up of oncological stations which are much more numerous than the oncological dispensaries. They constitute the connecting link between the oncological dispensaries and establishments of the general medical system and large polyclinics. Furthermore, the oncological sections within the general hospitals have functions corresponding to those of the oncological stations.

Outside of cities with dispensaries, oncological stations have been established in all administrative centers, and in other large localities, in the ratio of one station per 100,000 or 200,000 inhabitants.

The functions of the oncological stations (and their counterparts, the oncological sections at hospitals) are practically the same as those of the oncological dispensaries, except that their jurisdiction is limited to their own territories.

At present, there are in the Soviet Union 160 oncological dispensaries and their number will be increased. Oncological stations number about 870.

Moreover, forming a part of the system of oncological establishments are twelve oncological and radio-oncological institutes which, in addition to their tasks of scientific research and treatment, exercise scientific and methodological control over the entire specialized system.

Finally, the numerous "homes of health education," and the multiple Red Cross organizations with their millions of members contribute to the dissemination of information on cancer and means of avoiding it.

The general management of this vast system of oncological establishments is exercised by the Ministry of Health USSR and its local organs.

With respect to the scientific and methodological plan, the direction of these activities is concentrated in the Committee for the Struggle against Cancer, attached to the Scientific Council, Ministry of Health USSR.

The question arises: What are the results of the work of this vast oncological system?

In answer to this question, here are some data:

(1) The fact that the state system of health protection comprises a vast network of oncological establishments has made it possible to organize detailed and general statistics of malignant-tumor cases and from this enormous amount of material to obtain reduced data on oncological diseases and their distribution, as well as to study the mortality resulting from malignant tumors.

It is interesting to note that in the Soviet Union, as in most other countries, the form of cancer most frequently encountered is cancer of the stomach. According to cancer statistics for the territory of the Russian Federated Republic, 32 percent of the oncological diseases involved cancer of the stomach. Malignant tumors of the uterus come next with 16 percent of the cases recorded. However, if the ratio is calculated with respect to the female population alone, the proportion of cancer of the uterus is 26 percent, a figure equal to that of stomach cancer. Next in order of occurrence are, respectively, skin cancer (12 percent), breast cancer (7 percent), cancer of the lips and of the buccal cavity (7 percent), lung cancer (6 percent), cancer of the esophagus (6 percent), cancer of the rectum (2.5 percent), and cancer of the larynx (1.5 percent).

No less interesting are the data obtained from studying distribution with regard to such factors as geographic location, climate environment, etc. Thus we were able to establish that of the cases of malignant tumor in the Russian Federated Republic cancer of the skin represents 12 percent of the total; in the south of the Republic the incidence for this form of cancer rises to 26 percent, whereas in the north it drops to 6 or 7 percent.

The average incidence of cancer of the mouth in the Russian Federated Republic is 7 percent; in the various parts of Siberia it climbs to 12-15 percent, while in the cities of Moscow and Leningrad and in many other regions it declines to 2.5 percent.

The same distribution is noted for cancer of the esophagus.

It should be emphasized that data of this kind become very important (not only for the organisational plan but also for the purely scientific plan) in undertaking a study of the etiology and pathogenesis of cancer in man.

(2) The fact that the efforts of the anticancer organizations have succeeded in focusing attention on the cancer problem and have induced thousands of nonspecialized physicians and the public itself to participate in the campaign has greatly contributed to rendering the anticancer campaign more effective.

Of course these measures are indispensable for early detection of cancer and accordingly for effective treatment.

(3) In the campaign for early diagnosis and prophylaxis (which, according to the latest data, is quite feasible), we have been very successful thanks to a new method which can be applied on a large scale, but only by a large State oncological organization. We should like to discuss the method of conducting mass prophylactic examinations, embracing all people over 35 years of age.

Of the many measures taken in the anticancer campaign, this method now is absolutely obligatory in our country. It is applied according to an annual plan fixed by the Ministry of Health.

As a general rule, the prophylactic examinations are made by a team consisting of a therapist, a surgeon, and a gynecologist. They examine the organs most susceptible to cancer: skin, lips and buccal cavity, esophagus, stomach, and rectum. In the case of women, the breasts and uterus are also examined. Sometimes the examination is limited to certain organs, wherein the gynecologist examines the genital organs, the rectum, and the breasts for the sole purpose of detecting cancer and precancerous conditions.

Two examinations are made: the first aims at detecting pronounced cases of cancer, through general clinical procedures, and pathological conditions suspected to be cancer or precancerous conditions. After the patients have been classified, a second examination is made in greater detail at the polyclinic or

the hospitalization center. In cases where diagnosis is difficult to establish, the patients remain under observations for 2 or 3 weeks.

It is essential that the mass examinations in enterprises and rural localities be preceded by popular lectures on health, given by the oncological dispensaries with the assistance of the personnel of the Red Cross and the Homes of Health Instruction. This procedure greatly contributes to the success of the work.

At present, the number of individuals examined annually totals 10 million. Here are the results obtained: (a) the number of cancer cases detected, especially cancer in the first stage of development, ranges from 0.11 to 0.15 percent of the total number of persons examined; (b) the number of persons with precancerous lesions amounts to from 0.8 to 0.9 percent. Early detection and treatment of the latter group constitutes effective prophylaxis.

In certain areas, regularly prophylactic examinations of persons over 35 years of age are repeated until the complete disappearance of incurable cases of cancer of the uterus, breast, etc.

The periodic examination of patients stricken with those nosological forms of long standing which may be included in the group of precancerous examinations forms a separate branch of the system of prophylactic examinations. (It must be emphasized that mass prophylactic examination has proven its effectiveness not only as concerns the plan for early diagnosis of cancer and precancerous conditions but also the plan for training oncologists.)

(4) Among the most important achievements of the oncological organization we must mention the regular increase in the early detection of cancer in patients whose afflictions are difficult to diagnose. On the other hand, the number of diagnoses of incurable cases diminishes systematically, while the number of patients which can still be cured increases.

(5) Another fact adding to the credit of our organizations is the constant spread in the everyday practice of Soviet medical establishments of cancer therapy, which has proven its effectiveness in the major oncological institutes. We must mention particularly the combined therapeutic methods which are applied on the basis of strict individualization of each case.

(6) The most conclusive proof of the effectiveness of our organizations is the fact that the recovery ratio increases from year to year. In 1953 recovery was achieved in 65 percent of the cases of malignant tumors recorded in the Russian Federated Republic.

In conclusion, a few words on the program for training oncologists. Specialization is based on consideration of the needs of the oncological system and is carried out in accordance with an annual plan drawn up by the Ministry of Health. It provides three procedures, as follows:

(1) Specialization in chairs of oncology in institutes for the postgraduate training of physicians specialising in surgery, gynecology, and radiology. Here these physicians are trained for five months in oncology, a new field for them, under a rigidly defined program.

(2) "Ordinantura" (a type of internship) in clinics of oncological institutes. Here the training is more comprehensive and lasts 3 years. During this time the interns remain at the institute with the title of scientific associate.

(3) "Aspirantura" (research fellowship) at oncological institutes or chairs of oncology in postgraduate-training institutes. Here the oncological

specialization, which also lasts 3 years, is concluded by the writing and defending of a doctoral-professorial thesis.

The first two procedures are designed for training ordinary physicians for oncological establishments. The third is for training administrative and scientific cadres for oncological service.

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PROPHYLAXIS AND TREATMENT OF CANCER OF THE CERVIX OF THE UTERUS

E. A. Bazlov
(In charge of the
1954 course)

The struggle against malignant neoplasms of the female genital organs must be pursued in a complex manner. The solution of this problem requires not only diagnosis and treatment but also preventive measures taken on a wide scale.

In the Soviet Union great attention is given to the detection and rational treatment of precancerous conditions of the cervix of the uterus as well as to the detection of early cancer of the same. These measures can be carried out thanks to the systematic preventive examinations of women given in the medical departments of industrial enterprises and in all hospitals, polyclinics, and gynecological clinics.

In this manner a great number of women are covered by this system of prophylactic examinations. For example, in the Ukrainian Republic during 1953 alone, 1,709,041 women were examined.

These examinations revealed such precancerous conditions as erosion of the uterine cervix, leukoplasts, ectropions, endocervicites, polyps and others, in 17,120 women, i.e., 1.5 percent of the total number of women examined.

The problem of treating precancerous diseases of the cervix of the uterus is of great interest at the present time. This is why in the Soviet Union these diseases are made the object of systematic observation and treatment in oncological dispensaries and gynecological consultations.

The prophylactic measures taken in the Ukraine in 1953 brought recovery to 16,070 women who had been under observation in oncological establishments for precancerous conditions. Undoubtedly these measures are effective in lowering the incidence of uterocervical cancer.

According to a special instruction of the Ministry of Public Health, one prophylactic measure is the compulsory examination of the uterine cervix by means of a speculum after childbirth and the suturing of lacerations if there are any. The suturing of lacerations of the uterine cervix after childbirth is considered a measure of prophylaxis of precancerous conditions and, hence, of cancer of the cervix of the uterus.

Prophylactic examination of women permits not only detection of precancerous conditions but the discovery of tumors of the cervix at an early stage. In the Soviet Union preventive examinations were instrumental in revealing cancerous processes in 0.02 to 0.05 percent of the cases studied.

The application of active prophylaxis measures and the extensive onco-

[illegible] care provided by dispensaries has resulted in a marked decline in the number of cancerous forms.

In 1953 for example, there were two times . . . of the fourth group of cancer of the cervix than in 1949, and . . . there were eight times fewer cases during the same period. [Sentence incomplete, several words missing]

In the Soviet Union, cancer of the uterine cervix is treated chiefly by radiotherapy. According to a special instruction, surgical treatment is principally employed only during the first phase of the disease, with subsequent roentgenotherapy.

It would be pointless to discuss the respective advantages of surgery and radiotherapy, in view of the fact that there can be no single method of treatment, even in the first phase of the disease. It is not the method itself that determines the result, but rather the judicious choice of a method of treatment and its proper application.

In general, surgical treatment is recommended for young patients whose general condition is satisfactory.

The Soviet Union has accumulated a large quantity of data on surgical treatment with subsequent roentgenotherapy of cancer of the cervix of the uterus in the first stage.

According to data by Mikhailov and Terekhova (Moscow) on 800 hysterectomies, recovery occurred in 57.6 percent of the cases, the patients remaining under medical observation for 5 years and more.

In the city of Gorki, according to Dobrotin reporting on 1,102 operations after 5 years and more, 64.5 percent of the patients were cured.

In the Roentgeno-Radiological Institute of the Ukraine, applying preoperative roentgenotherapy, we obtained complete recovery at the end of a 5-year period of observation in 70 percent of 157 surgical cases.

Our evaluation of the effectiveness of radiotherapy is based on the results obtained with 1,648 women who were treated at the Ukrainian Institute of Roentgenotherapy and Oncology in Kharkov between 1945 and 1950, i.e., we present results of treatment at the end of 5 years and more. It must be pointed out that our results are evaluated not on the criterion of survival, as is done by some authors, but on the basis of complete clinical recovery:

	Percentage of Recovery
Stage I	75.1
Stage II	51.3
Stage III	12.5

We see that in the first and second stages of the disease radiotherapy gives the most favorable results.

In the third stage the results are less satisfactory. This is partly explained by the fact that at the Institute a large number of patients with cancerous processes on the boundary between the third and fourth stages are reported as third-stage cases.

At the Leningrad Oncological Institute recovery at the end of 5 years is 20.2 percent of cases in the third stage of the disease, and 5.3 percent of cases in the fourth stage.

In most of the major clinics in the Soviet Union, such as our Institute,

treatment in the first and second stages begins with roentgenotherapy.

The treatment of cancer of the uterine cervix starts with radium irradiation of the tumor of the cervix and simultaneous irradiation of the cervical canal and the parametral regions. This is followed by irradiation of the uterine cavity, because it is difficult to determine the upper boundary of the affection.

We see to it that two thirds of the total dose reaches the region of the canal and the region of the uterine cavity. The duration of the radium treatments was from 45 to 48 hours and was reduced only in cases with complications. We consider treatments of 24 hours to be impracticable in view of the fact that their number must be increased, a circumstance which causes additional trauma of the genital organs.

To irradiate the uterine cavity we use radium needles which we introduce without previously expanding the cervix. We resorted to expansion of the cervical canal only in exceptional cases.

In each treatment we use 3 or 4 radium needles containing 10 to 15 mg of radium. The patients receive 1,000-1,500 mg-hours of radium per treatment. The radium-therapy course consists of 5 or 6 treatments of this type. The total dose is 6,000 to 8,000 mg-hours; with x-rays at point "A" (according to Todt and Moredith), the total dose used ranges from 7,000 to 12,000 roentgens; with x-rays at point "B", from 1,500 to 3,000 roentgens.

Double-filter tubes (1 mm platinum, and 1 mm gold) are introduced in the vagina, and a single filter (1 mm platinum) in the uterine cavity.

We try to carry out the radium therapy in a single treatment. As a rule, we do not repeat the radium-therapy treatments. The radium treatment is repeated only in exceptional cases when, for one reason or another, the treatment was not completely successful. After the radium therapy the patients undergo external roentgenotherapy under the following conditions: 200 kilovolts; 10 milliamperes; distance from source to the skin, 50 cm; 1 mm copper filter and 1 mm aluminum filter on a 10 x 15 cm region. We operated on both parametral and gluteal regions and on the sacrococcygeal region. The daily dose per treatment is 250-300 "R" on one or two regions. Total dose 8,000-10,000 "ch". Intensity of dose 26 "ch" per minute. The layer "A" (absorption one half) is 1.5 mm copper.

In the last few years, we have made wide use of radioactive cobalt 60 in treating cancer of the cervix of the uterus.

In analyzing the results of the treatment, we studied the relationship between the efficacy of the treatment and age of the patients, under the same method, dose, and stage of the disease.

The percentage of recovery for patients in the second stage increased regularly with age. Thus, for patients under 40 years old, recovery was 44 percent, whereas for patients over 50 years old, it reached 60 percent. Therefore the conclusion can be drawn that age, as the whole of characteristics of the organism, exerts a certain influence on the course of the disease.

Analogous age relationships were also noted with patients in the third stage of the disease.

As to the nature of the tumorous growth (endophyte or exophyte, histological structure, and degree of malignancy), all these factors have no effect at all on the results obtained after treatment.

Another problem in which we became interested was what total dose shows

the optimum efficacy. We found that for patients in the fourth stage a total dose of 8,000 to 10,000 R at the point "A" and 2,000 R at "B" give an incidence of recovery of 58.1 percent at the end of a five-year observation period. An increase in the total dose of radium therapy over the dose indicated above entails a diminution of the percentage of favorable cases to 44 percent.

Less satisfactory results were also observed with smaller doses.

Roentgenotherapy prior to the radium treatment did not increase the efficacy of the treatment.

We attach great importance to maintaining the rhythm of irradiations. Intervals between radium therapy treatments greater than five days and great intervals between radium therapy and roentgenotherapy caused a decrease in the effectiveness of the treatment.

Analysis of the causes of failure of the treatment showed that the unfavorable results in 30 percent of the cases were due to an imperfect rhythm of irradiations.

One factor which strongly affects the rhythm of irradiations and the total dose is the presence of inflammatory processes in the pelvis, processes existing prior to the development of cancer or caused by the tumorous proliferation. These inflammations often become aggravated during the radiological treatment, a circumstance which often causes the treatment to fail.

Years of observing these groups of patients and the experience obtained in this field allow us to recommend, in addition to a wider use of antibiotics and medicaments which stimulate the reactivity of the organism, the application of radiotherapy in the form of roentgenotherapy to be followed (for certain patients) by a course of radium therapy. This complex treatment assures good results in many patients, even in cases of advanced tumors.

Thanks to this method, five years after the treatment of cancer of the uterine cervix complicated with inflammatory processes in the pelvis, we obtained clinical recovery in 4 out of 5 first-stage patients treated by this method. With second-stage patients, recovery was noted in 20 out of 53 cases treated. With third-stage patients, recovery was obtained in only two cases.

With respect to bladder or rectum complications caused by radiotherapy, we have not noted any such occurrences with our method of irradiation.

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